

James Acker:

Chris Lynnes will now give his presentation on the next generation of Giovanni - Giovanni-4!  
(Now I'm thinking of the 'Fantastic Four' super heroes).

Chris Lynnes:

Thx, Jim!

#### Slide 1

Hi! I'm going to talk about our current work on evolving Giovanni, from its current version, version 3, to the next generation Giovanni, Version 4.

#### Slide 2

Why mess with a good thing?

The reason is that we want to keep Giovanni around for the long haul  
AND be able to keep up with new science products and evolving science needs.

To do that, we need to reduce maintenance costs,  
which have increased as we have added more datasets and features.

It's gotten hard to add new features, and even maintain some of the ones we have.

We have gotten a lot of suggestions for features, but aside from very minor changes,  
any significant change runs into an architecture that is too "brittle".

So, we are refactoring the architecture for long term sustainability.

Sorry, a lot of engineer-speak. With that out of the way, I'm going to talk  
about our main goals and features of Giovanni 4, or G4 as we call it.

#### Slide 3

So one key goal is obviously to reduce the cost of maintenance and enhancement.

One way we are going to do this is to use more off-the-shelf components.

If we are successful, then we can also work through some of the user suggestions we have been unable to afford.

Also, make it run faster. (Faster!)

And, upgrade the User Interface: it's so "2007" :-).

James Acker:

Laughter

Chris Lynnes:

We want to take advantage of some of the advances in user interfaces that you see at sites like Amazon, Zappos, you name it.

Many changes are also based on a usability study conducted this past summer.

We've learned from user feedback that new and occasional users in particular struggle with navigating the interface.

Slide 4

Let's take a look at some of the key new features of Giovanni-4 ...

Slide 5

The first and most important feature is to carry over the current Giovanni capabilities that are in use by the community.

This applies to services, datasets and capabilities.

We will keep Giovanni 3 available until we transition everything over, and there will likely be some overlap period.

However, for Giovanni 4, aka G4, we also want to add some new features as we go along...

#### Slide 6

One thing users have told us is that they don't like jumping from one Giovanni "instance" to another.

This slide shows part of the G3 set of portals, and you can see a set of similar portals whose main difference is temporal resolution. Currently, we cannot mix temporal resolution in G3.

In G4, we will have more flexibility in which data variables can be mixed and matched in a portal.

So we won't be forced to construct multiple portals just due to differences in temporal resolution as we do in G3.

In fact, we plan for an Omnibus portal that would hold nearly all the data variables.

We will still support thematic portals based on discipline or project, but likely fewer than G3.

#### Slide 7

One thing that many agree on is that it would be nice for Giovanni just to run faster.

We will be able to do that for several services:

For some services, we are leveraging high performance tools like "nco".

For some other services (e.g., correlation maps), we are re-writing the service in C.

#### Slide 8

So if you ask for more than 1 year of data in G3, we suggest you get a cup of coffee...

#### Slide 9

The early results on the same service in G4 suggests that you can run up to EIGHT years of data\* before you need that cup of coffee to occupy you.

(Good for you, maybe not for your barista.)

\*Note that this holds for cases where input data have been cached.

Both G3 and G4 support similar caching capabilities.

Most of the time when you are using G3, the data have been cached. (We have a very big cache area.)

#### Slide 10

OK, but if we put all the Giovanni variables in one Omnibus portal, or even all the Aerosol variables in an Aerosols portal, users need some way of finding the variables of interest.

For this, we are borrowing heavily from mainstream shopping sites and search engines...

#### Slide 11

One navigation aid that you see in most stores is "faceted browse".

This is where you select desirable attributes, say a Measurement of Total Aerosol Optical Depth, and the User interface narrows down to just the data fields that have Total AOD.

(This actually feels much more intuitive when you run it live, with its interaction, than seeing it on these slides.)

Then if you select Instrument = MODIS, the field narrows further.

The numbers in parentheses show you how many data fields have that particular attribute.

#### Slide 12

The second new feature is the keyword filter, which we "borrowed" from mainstream search engines.

Here, you type in the desired keyword and press Search

The interface will then show just the variables matching that keyword.

#### Slide 13

Don't know exactly which keywords to type in to get a match?

Just start typing something and we'll provide suggestions from the keywords that we have extracted from the data variables.

(The keywords are not case-sensitive.)

#### Slide 14

Now, we know that the new user interface may be disconcerting to experienced users--like this audience--at first.

We are trying to add features in for repeat users as well to make it easier and faster to get to what you want.

Here's a little "trick" we call the Bookmarkable URL.

As you fill in the selection form, we update the URL--BEFORE you even hit the Plot button.

James Acker:

This looks very useful for researchers specializing in particular areas!

Chris Lynnes:

This means that if there is a particular kind of plot you do a lot, variables you use a lot, region you study a lot, you can fill out the form for that, and bookmark it.

Later, you can come back to that bookmark, modify other fields in it only as necessary, and Plot. We will gratefully accept other ideas for shortcuts for repeat users as well...

#### Slide 15

Another new feature we are adding is an Interactive Scatterplot.

This draws the X-Y plot alongside a map of the data locations.

Interacting with one side affects what is shown in the other side.

Note: This is currently limited to 100,000 points at present due to memory limitations in most browsers.

#### Slide 16

If you hover your mouse over a given point, it will show you the numerical values.

#### Slide 17

Click on a point, and it will show just that point on the map so that you can see where the point is located.

This can be very powerful for diagnosing the causes of anomalous points.

Amanda Truett:  
Nice feature!

Chris Lynnes:  
Thx!

#### Slide 18

You can zoom in on any part of the scatterplot.

This then shows you on the map just the points in that region of the plot.

Here we are looking at the high AOD values.

It also recalculates the regression line for just those points.  
(Known Issue: Too many significant figures! Will fix...)

#### Slide 19

Likewise, you can select a subregion of the map, and the scatterplot will be culled to show just the points from that subregion.

Again, we recalculate the regression line.

#### Slide 20

So: this is the rollout for the new Giovanni 4.

We were shooting for the Beta release as of this talk, but the developers are working through one last-minute glitch...

I will post an announcement--with the URL--in the chat as soon as it is ready,

likely in the next day or two.

We are beginning with this beta test, which has most of the aerosol variables and a limited number of services.

Hopefully, the most popular services.

James Acker:

We can also tweet it (next presentation).

Chris Lynnes:

Over time, we will add:

- + more services

- + more datasets and variables

- + more features.

In general, we will put out a new release every 2 to 4 weeks.

And it bears repeating that G3 will remain available until the capability can be migrated to G4.

However, investment in new features will go into G4.

One note about the Beta release performance: It will take some time to cache the most commonly used data,

so it may be slow in the first few days. It will speed up as we get that data into local cache.

The process of migrating G3 capabilities to G4 will take many months.

Please help us prioritize by advocating for your favorite variable, plot type or feature.

Use the Feedback button in Giovanni 4 if possible, or send mail to:  
[gsfc-agiovanni-dev-disc@lists.nasa.gov](mailto:gsfc-agiovanni-dev-disc@lists.nasa.gov).

Thank you!

James Acker:

I'll put that feedback email address in a tweet, too.

Questions? My next presentation is short -- feel free to ask.

(That would be questions to Chris, not me!)

Just as a reminder to everyone here, all the presentations will go online soon after the workshop. We'll let the authors make sure the final version is the way they like it before they hand it to us for posting.

The final version of this presentation will include the Beta test URL.